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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,578	04/14/2004	Huang-Chen Guo	3313-1156PUS1	5022

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EXAMINER	
PEACE, RHONDA S	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 06/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/823,578	GUO ET AL.	
	Examiner	Art Unit	
	Rhonda S. Peace	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 0404.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Inventorship

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marcuse et al (US 6385383).

Pertaining to claims 1-3 and 10, Marcuse et al discloses a waveguide structure **150** comprising a polymer core **155** embedded within a cladding layer **165**, where the cladding layer **165** may be made of a polymer or another material, such as glass (column 4 lines 13-20, column 1 lines 24-27, Figures 4A and 4B). The use of a polymer within the core allows the core's index of refraction to vary as the temperature of the core is varied, thereby adjusting the level of attenuation achieved by the waveguide (column 3 lines 54-57). While this waveguide structure **150**, as described by Marcuse et al, is described along the general format of a planar waveguide structure, however Marcuse et al also teaches other waveguide structures are also appropriate (column 3 lines 23-25). It would have been obvious to one of ordinary skill in the art to use, as an alternative to waveguide structure **150**, an S-type waveguide for example, for the reason of increasing the attenuation of light intensity possible within the waveguide. It is well known within the art that a curved fiber or waveguide experiences attenuation because as light travels around the curve in the fiber or waveguide, some of the light is

lost to the cladding, thereby creating attenuation of the optical signal. Therefore, if it is the purpose of the invention to create attenuation, it would be desirable to do so by various means, such as including a fiber or waveguide geometry that would encourage attenuation without needed an electrical signal to vary the temperature of a layer within the waveguide or fiber. In addition, the keen use of geometry to aide in attenuation of the optical signal will also decrease the voltage signals needed to provide proper attenuation, thereby conserving the device's consumption of power. In addition, Marcuse et al also describes an attenuator and its method of use, where a polymer cladding within a waveguide has an index of refraction that varies with temperature of the cladding material (column 1 lines 40-65). While Marcuse et al describes this attenuator as one with a polymer cladding, the attenuator may also use other waveguide structures, such as the polymer core waveguide described above, as Marcuse et al describes the polymer-core waveguide, as well as the attenuator, as optical structures that will facilitate the interruption of optical signals within a waveguide (column 1 lines 33-36).

Referring to claims 4 and 7-9, Marcuse et al discloses the use of both a heater **205** and a cooling device **210** located adjacent to the polymer layer **120**, in order to vary the temperature of the polymer layer **120** within the waveguide **200**, which is discussed within US 6385383 as a polymer cladding layer, but as explained above, also encompasses a polymer core layer (column 6 lines 7-18). As well, this heater and cooling device are in the form of chrome strips applied adjacent to the polymer material, acting as electrodes, and both are coupled to a voltage source so that the electrode-

type heater and cooling device may heat or cool the polymer material to change the index of refraction of the polymer material (column 4 lines 27-38). As before, while Marcuse et al describes this waveguide system as one with a polymer cladding, the system may also use other waveguide structures, such as the polymer core waveguide described above where the electrode-type heater and cooler would then be coupled to the polymer core, as Marcuse et al describes the polymer-core waveguide, as well as the polymer-cladding, as optical structures that will facilitate the interruption of optical signals within a waveguide (column 1 lines 33-36, column 3 lines 22-25).

Concerning claims 5 and 6, while the waveguide structure and corresponding attenuator have been previously described as a polymer core embedded within a cladding, as discussed above. However, in reference to waveguide system **150** of Figure 4A and 4B, the substrate **160** may act as a cladding layer composed of glass (column 3 lines 18-21), thereby allowing the cladding layer **165** to act as a buffer between the electrode-type chrome strips and the core layer. Marcuse et al also describes that materials similar to silica and doped silica may be used to create the cladding layer (column 1 lines 24-29), which at this time is considered to be a buffer. As it is well known in the art, silicon dioxide provides an excellent substitution for the silica or doped silica mentioned above, as it is both optically transparent, allowing optical signals to propagate through it, but also has a low dielectric constant around 4. A low dielectric constant material would be desirable buffer between the polymer core and electrode-type heater **205** and cooling device **210**, because it will allow a greater of flow of charge from electrode-type voltage suppliers to the core than would glass alone, as

glass has a higher dielectric constant than silicon dioxide. In addition, materials with a higher dielectric constant, as well known in the art, are subject to more damage when in the presence of a strong electric field, therefore making the silicon dioxide with its lower dielectric constant a more preferable material to place between the core and electrode type as it is subject to less break down in the presence of the electric field created by the electrode type heater **205** and cooling device **210**.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wagoner et al (US 5,966,493) teaches a fiber optic attenuation system that is formed by removal of the cladding layer adjacent the core layer. Next, a controllable material, such a polymer which can be varied with temperature, is formed upon the core where the cladding has been removed, and an electrode passes a charge through the device at this same point, as to change the refractive index of the controllable material, thereby increasing or decreasing the attenuation of the optical signal. In addition, a heater is coupled to the electrodes of the Wagoner et al device. He (US Publication 2002/0136525) describes an optical attenuator using an S-shaped waveguide, where an electrode and power supply is coupled to an optical guiding region within the S-shaped waveguide. The application of a voltage induces changes in the refractive index of an electrically variable refractive index region, thereby affecting the attenuation of the device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rhonda S. Peace whose telephone number is (571) 272-8580. The examiner can normally be reached on M-F (8-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272- 2344.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rhonda S. Peace 6/14/05

Rhonda S. Peace
Examiner
Art Unit 2874

John D. Lee
John D. Lee
Primary Examiner